But the language which it would be necessary to employ would resemble so closely what has been used above touching *Rhacodes* and *Armadillidium*, that it might be wearisome to your readers. The qualities of Dr. Gerstäcker's work are too well known to make it necessary to conclude with compliments as a set-off against fault-finding.

Croydon,
October 4, 1882.

XXXVIII.—*Spermatozoa, Polygonal Cell-structure, and the Green Colour in* Spongilla, *together with a new Species.*

By H. J. Carter, F.R.S. &c.

[Plate XVI.]

As time progresses so experience throws light upon the nature of objects previously unrealized, and thus, much of what was simply (if correctly) recorded years before may derive explanation from more recent discoveries that have been made *public*.

When I was studying the freshwater sponges of the tanks in Bombay, about 1850, Lieberkühn was engaged with those from the river Spree, at Berlin; and although we were both working on the same subject, our facts were differently handled; for while Lieberkühn had for friend and adviser Johannes Müller at Berlin, I not only had no one of the kind at Bombay, but at that time was beholden to others for the loan even of a microscope, so that literally I then felt that all I could do was to describe and delineate faithfully what came before me both for text-book of reference and publication.

Yet was I not altogether without assistance and advice; for at University College, London, I had been educated in part under my kind and dear friends Professors Grant and Sharpey, whose exemplary love of truth stood by me when alone, and has ever kept me in the path of fearless accuracy.

For the purpose of recording my observations, I kept a "journal," in which was not only described, but delineated in colours, every thing that appeared to me worth recording; so that after many years this journal, still continued, often furnishes me with the means of confirming and realizing discoveries which I myself had long since unwittingly made—although often imperfectly, from the limited power of my microscope.

Thus Mr. Saville Kent, in his excellent 'Manual of the

Infusoria' (p. 345, pl. iii. fig. 1), has recognized and reproduced a sketch which I made in the month of April 1855 (from a colony of organisms on a filament of *Cladophora*) as a "*Salpingœca*" or a "*Monosiga*" of his order Choano-flagellata, upwards of ten years before these remarkable Infusoria were first brought to notice in the late Prof. H. James-Clark's memorable paper (Memoirs Bost. Soc. Nat. Hist. vol. i. pt. 3).

Again, in the month of February 1855, at pp. 99 and 101 of this "journal," I find the discovery of the "starch-granule" in *Spongilla* (*S. Meyeni*) not only described, but figured and coloured under the effect of iodine, which I did not mention publicly until the following year ('Annals,' February, vol. xvii. p. 106), and did not delineate for publication until 1859, when I endeavoured to show the close alliance in structure and composition that exists between the "seed-like" body of *Spongilla Carteri* and the winter-egg of the polyzoon *Lophopus* ('Annals,' vol. iii. p. 331, pl. viii. fig. 7).

Also again, at p. 77 of the first volume of this "journal," on the 12th August, 1854, I find sketches of the monociliated sponge-cell (spongozoon) with the supposed zoosperm attached to it, as represented in the 'Annals' of August 1856 (vol. xviii. pl. vi. fig. 43)—but with the two then-called "ear-like processes" or "spines" to which I have alluded ('Annals,' November 1879, vol. iv. p. 382), these having been omitted in the published figure because I was not certain of their general occurrence until 1859 (*ib.* vol. iii. p. 14, pl. i. figs. 12–14), after which they were identified (under a higher power probably) with the outlines of the "collar" by Prof. H. James-Clark in September 1867 (*op. cit.* p. 21, footnote).

It is the absence of the "collar" or these "ear-like processes" in the supposed zoosperm and their presence in the sponge-cell (spongozoon), together with the much smaller size of the former and its spherical head, that appear to constitute the outward differences between the two, all of which, excepting the "ear-like processes" (which were not known then), may be seen in Lieberkühn's figures of the monociliated sponge-cell and the zoosperm respectively from *Spongilla* in 1856 (Archiv f. Anat. Physiologie &c., Heft iv. Taf. xv. figs. 34 and 36); but no one since seems to have confirmed this publicly, while the sperm-cell in the marine sponges has often been figured, and in all instances *without* the "collar." Accompanying my sketches are the following notes, viz. :—"The above drawings of the *Spongilla*-zoosperm were very distinctly seen, particularly no. 1 [Pl. XVI. fig. 8, *b*], a transparent cell with a single granule in contact with the wall. No. 2 [Pl. XVI. fig. 8, *a*] was also monociliated, but larger and more granuliferous; it

had occasionally the two remarkable [ear-like] processes better seen in no. 3 [Pl. XVI. fig. 8, *c*, where both "*a*" and "*b*" are figured together]. This form [viz. with the ear-like processes] I have so often seen that, if it is not constant, it is very frequent." Hence at that early period I had not only noticed the "ear-like processes," which were subsequently identified with the "profile" outlines of the "collar," but the cilium of the same form of sponge-cell which I afterwards found to take in particles of food (indigo), and finally called "spongozoon," in connexion with a much smaller *spherical* cell that in the previous year, viz. 1854 ('Annals,' vol. xiv. p. 334, pl. xi. figs. 1–6), I had taken for the zoosperm of *Spongilla*; and although some little time afterwards I thought otherwise, still I *now* see, from its comparative smallness and the subsequent representations of others, that I was probably right in my original conjecture. Fortunately figures were published in the 'Annals' about the same time these facts were noticed; and therefore what has just been stated cannot be considered a mere afterthought of the present day.

Lastly, I have to allude to a figure in my "journal" on the 29th March, 1857, which I have always regretted that I did not represent with the description of the "isolated ovi-bearing sponge-cell" in the "Ultimate Structure of *Spongilla*" ('Annals,' July 1857, vol. xx. p. 26), and which in the course of development becomes the ampullaceous sac *, since, besides being isolated in the watch-glass wherein a young *Spongilla* after having been fed with carmine had been torn to pieces, it may present a *vibratory* movement of the cilia *inside*, while the continuity of its capsule outside is indicated by its having refused throughout to admit any of the colouring-matter (Pl. XVI. fig. 7); thus, instead of the ampullaceous sac, it *now* appears to me to have resembled the "Spermaballen" first pointed out in *Spongilla* by Lieberkühn in 1856 (*op. cit.* Heft v. Taf. xviii. fig. 10), then by F. E. Schulze in *Halisarca lobularis* in 1877 (Zeitschrift f. wiss. Zool. Bd. xxviii. Taf. iii. fig. 18), and lately by Metschnikoff in 1879, in *Halisarca Dujardinii* (*ib.* Bd. xxxii. Taf. xx. fig. 2). The subjoined note in my "journal" on the last occasion that I saw this cell is dated 31st March, 1859, and runs as follows:—"In the last examination an isolated sponge-cell was seen

* The so-called "ovi-bearing sponge-cells" in this paper are the *spherical* cells of the *statoblast*, which contain the germs (formerly viewed by myself as ova, and hence the appellation). On the contents of the statoblast issuing under germination, these "spherical cells" and their contained germs appear *bodily* to become the ampullaceous sacs in the young *Spongilla*, and, in some if not in all instances, to end in becoming respectively developed into new statoblasts.

with the cilia waving *in* it." By the "last occasion" is meant that in which the young *Spongilla* was grown from the statoblast in a watch-glass, as usual, for microscopical examination, which is the only convenient way of examining it, as then a perfect sponge is obtained which can be brought under a higher power without molestation (and eventually torn to pieces if necessary) during the whole course of its development. Detaching a portion from a large mass does not offer all these advantages, from the shock to the living functions occasioned by such a procedure; while to obtain the young *Spongillæ* it is only necessary to get a portion of an old *living* specimen bearing statoblasts, and, having taken out a few (six to twelve) of the latter, to roll them gently between the folds of a towel to free them from all extra material as much as possible, place them in a watch-glass so as *not* to touch each other, with a little water, in a saucer or dish filled with small shot, to keep the saucer upright, and, covering them with a glass shade, transfer the whole to a window-bench opposite the light. In a few days the young *Spongilla* may be observed (from its white colour) issuing from the statoblast and gluing the latter as well as itself to the watch-glass, when it will be ready for transfer to the field of the microscope for examination, care being taken that it is *never* uncovered by the water, which may be replenished as often as necessary; but of course the object-glass (when $\frac{1}{4}$ inch with high ocular is used for viewing the minuter structure) must admit of being *dipped* into the water *without suffusion* of the lens.

Returning to the "Spermaballen," it is even *now* difficult to recognize them in the living or dead state, on account of their being so much like the ampullaceous sacs (Geiselkammer) on the one hand and ova of the same size on the other. Their being unconnected with the branches of the canal-system may help to distinguish them from the ampullaceous sacs, which in diameter are much of the same size, viz. "0·05 millim." (Schulze), in addition to their minute granular contents, which are the heads of the young spermatozoa; but this again confounds them with the ova at an early stage of the latter. When the spermatozoa are fully developed *within* their capsule at the time of examination, of course they may be easily recognized; but this coincidence does not happen often. Even in one of Prof. Schulze's exquisite preparations which he kindly sent me, of the "Spermaballen" in *Halisarca lobularis*, I can only see one with the cilia inside it, while the rest I should not recognize if not told by the label on the slide what they are; hence, by the inexperienced thus unassisted, the "Spermaballen" may be often seen without being recognized.

So long as these monociliated cells are only seen in the structure of *Spongilla* their nature remains doubtful, as they may belong to something else; but when they are found in distinct cells in the midst of this structure there can no longer be any room for such doubt. In their isolated state the spermatozoa have been seen and figured by many; but no one has ever witnessed their entry into the ovum (which is the concluding point), except Prof. Häckel. The four cilia attached to the ovum of *Leucandra aspera* figured by Keller are, of course, only conjectural of this (see 'Annals,' 1879, vol. iv. p. 383).

Fain would I now with my present knowledge return to the examination of *Spongilla* in its living state; but the time and opportunity for this are past, while upwards of five-and-twenty years have elapsed since Lieberkühn and myself worked at the subject; and no one having again taken it up leads me to hope that ere long the coincidence of taste and a residence where *Spongilla* grows may be followed by resumed investigation; for there is yet *very* much to be learnt of the histology and vital economy of the sponges generally, and none afford such facilities for this as those which grow in *fresh water*.

My chief object now, however, is to call attention to the presence of a cell-structure in *Spongilla*, which is like that of the polygonal parenchyma of plants, and the presence of which could hardly be anticipated by those who have only studied the marine sponges, and know no other persistent structure beyond the spicules and the horny fibre, especially one which if seen by itself would unhesitatingly be pronounced to be *phytoid*. Nevertheless it is a fact, as I first showed in 1859, when I made the illustrated comparison between the statoblast of *Spongilla Carteri* and the winter-egg of the Polyzoon *Lophopus*, to which I have already alluded (pl. viii. figs. 1–4). By reference to this communication it will be seen that there *is* a tissue of this kind in *Spongilla*, and that it surrounds the statoblast of *S. Carteri* in the form of a thick layer composed of hexagonal cells regularly arranged in columns perpendicular to the following coat *inwards* of this spheroidal body. This I noticed again last year to be the case with the statoblast of *Spongilla nitens* ('Annals,' 1881, vol. vii. p. 89, pl. v. fig. 3, *d* and *i*); but although so large in these two species as to be visible with a "doublet," it cannot be seen in the statoblasts of other sponges with the same power, although it is more or less present in a great many, and gives them that white colour which often characterizes this reproductive organ. When too minute to be seen without a very high power, as in *Spongilla alba*, *Parmula* (*Spongilla*) *Batesii*, &c., it presents a granular appearance, for which

I have used the term "microcell-structure" (*ibid.* p. 83, pl. v. fig. 2). In *Parmula Brownii*, however, it is much larger than in *P. Batesii*, and thus can be well seen under a power of 300 diameters, when it is found to be composed of spherical cells of different sizes, heaped together with the utmost irregularity (Pl. XVI. fig. 12); so that in structure and composition, although not in form and arrangement, it differs markedly from the uniform size and hexagonal figure of the cells in *S. Carteri* and *S. nitens*.

Lately another instance of the latter kind has been brought to my notice by Mr. Ed. Potts, of Philadelphia, in a species allied to *Spongilla fragilis*, Leidy ('=*S. Lordii*, Bk.'), var. *segregata*, Potts. This *Spongilla*, which is found at "Chester Creek" and other places in the State of Pennsylvania, is remarkable for having its statoblasts developed in *fours*, so as to present the tetrahedral form of the sporangium in *Selaginella cernua* &c. (Pl. XVI. fig. 9), surrounded in like manner by a capsule or layer composed of hexagonal cells like those of *S. Carteri* &c. (figs. 9, *d d d*, and 11, *a*, *b*), arranged in a columnar form throughout, but most evident in the angles between the statoblastlets, because it is thickest there, since it fills all the intervals between the four statoblastlets, thus causing the whole to assume a globular, tetrahedral shape. As this species will be more particularly described by Mr. Potts hereafter, the only part that concerns us now is this vegetable-looking cell-structure; and although, as I have before stated, starch-granules are mixed up with the germinal contents of the statoblasts, as in most seeds, yet the polygonal cell-structure of the capsule, when tested for cellulose in the usual way with sulphuric acid and iodine, presents nothing but a light amber colour, identical with that of the pith of Elder (*Sambucus nigra*) under the same circumstances; so that, although the blue colour of starch may not be produced in the polygonal cell-structure of *Spongilla*, it does not follow that it is a bit less composed of cellulose than Elder.

If we turn to the marine sponges for an instance similar to this parenchymatous tissue of *Spongilla*, I know not where to find it, unless the core or pith in the Ceratina be of this nature (see 'Annals,' 1881, vol. viii. p. 115, pl. ix. fig. 11, *f*). The "granules" here, which I have conjectured to be "*cellulæ in embryo*," form a light substance of a whitish-grey colour, very like the "microcell-structure" to which I have above alluded (Pl. XVI. fig. 12).

With reference to the "green colour" in *Spongilla*, I can state no more than I did in 1849, which is thus recapitulated:—"It is impossible, therefore, under these circumstances

to say, without further research, if the 'green colour' is owing to an additional tint to the colouring-matter of the cells or granules themselves, or to the presence of some foreign organism" ('Annals,' vol. iv. p. 97, "Descriptive Account of the Freshwater Sponges in Bombay"); and here is Mr. Sorby's statement in 1875 ("On the Chromatological Relations of *Spongilla fluviatilis*"), viz.:—"Though . . . the solution contained a small quantity of chlorophyll, yet I could not be certain that it had not been derived from a small portion of some alga accidentally enclosed in the sponge. The exact nature of the green substance is therefore still open to slight doubt" (Quart. Journ. Micros. Sci., n. s., no. 57, January, p. 47).

Now the "green colour" in *Spongilla* (which in Bombay chiefly shows itself in *S. Carteri*, and here in those parts which are most exposed to the light) is situated in the little spherical granules (? cellulæ) of the sponge-cell, the former of which vary under the 12,000th, and the latter under the 1000th of an inch in diameter: it is what they call "transparent;" that is, the tint, which presents a bluish emerald-green colour, is unaccompanied by any visible material; but as this part of the sponge comes into contact with the minute algæ of the water, which, in its growing state, it often encloses, it becomes, as before stated, almost impossible to say how much of one or how much of the other contributes to the green colour—not of course under the microscope, which can easily deal with organisms 1000th inch in diameter, but for separation to ascertain the position of the "spectral band," in order to see if it be the same as that of chlorophyll (hence Mr. Sorby's observation).

This, however, is not the case in *Hydra*, where the "green colour" is accompanied by visible material; that is, the green bodies themselves are granuliferous and much larger than the "green granules" in the sponge-cell, being about 1-4300th inch in diameter, and scattered plentifully throughout the ordinary tissue or sarcode of the animal, just as in *Difflugia pyriformis*, Perty ('Annals,' 1863, vol. xii. p. 253, "On the Presence of Chlorophyll-cells and Starch-granules as Normal Parts of the Organism, &c.," continued, with illustrations, in 1864, vol. xiii. p. 21, pl. i. figs. 1–4), and also in *Acanthocystis turfacea* (*ibid.* p. 36, pl. ii. fig. 25, *g*), in both of which instances they are accompanied by separate starch-granules.

Here I might observe that there is a point in the description of these two Rhizopoda which may be of interest to those who accept the views lately put forth by Dr. K. Brandt

of Berlin, viz. that "the green bodies found in *Hydra*, *Spongilla*, *Stentor*, &c." do not "correspond to the green chlorophyll-bodies of Algæ, but are themselves independent organisms, unicellular Algæ" ('Nature,' 1882, vol. xxv. p. 377); for both *Difflugia pyriformis* and *Acanthocystis turfacea* in England are often found in a colourless state, *i. e.* without the so-called green "chlorophyll-cells" (*op. et loc. cit.*)—facts which have been confirmed by Prof. Leidy in his memoir on the Freshwater Rhizopods of North America, pp. 99 and 267, pl. x. fig. 3, and pl. xliii. fig. 4, respectively (United-States Geological Survey, vol. xii.) *.

New Species of Spongilla.

I have now to describe, as far as the specimens will allow, a species of *Spongilla* from the island of Bombay, whose existence has only just now become known to me under the following circumstances, viz. :—On the 8th of March last, Prof. Dr. Margo, of the University at Budapest, kindly sent me a small jar containing a specimen of *Spongilla Carteri* from Lake Balaton, in Hungary, which he had recognized there; but not having any from Bombay for comparison, he submitted the question for my decision. Fortunately, still possessing the first and best specimen I had ever found of it in Bombay (viz. in 1847), which in my descriptive account I provisionally named *S. friabilis*, Lam. ('Annals,' 1849, vol. iv. p. 83)—*ten* years afterwards recognized by Dr. Bowerbank as a new species, and named by him "*Spongilla Carteri*," although not described and illustrated by him until 1863 (Proc. Zool. Soc. p. 31, pl. xxxviii. fig. 20)—I turned to this specimen for a bit to send to Dr. Margo, and thus came upon the statoblasts of the new species to which I have alluded, and which I will now describe, as far as possible, under the name of

Spongilla bombayensis, n. sp. (Pl. XVI. figs. 1–6.)

General form of the sponge itself unknown to me. Statoblast sessile, globular, more or less grouped and firmly at-

* A copy of this magnificent "memoir," containing forty-eight coloured plates of some thousand of figures, evidencing an amount of conscientious labour almost unparalleled, was liberally sent to me through the "Smithsonian Institution" at Washington; but of the 'Challenger' Reports I have only received *one* paper, and that, too, from a foreign author, viz. Prof. Dr. F. E. Schulze, of Gratz, who kindly sent me one of the "extra copies" of his contribution on *Euplectella aspergillum*, although at my own cost and labour I had long since published descriptions and illustrations of all the sponges dredged on board H.M.S. 'Porcupine' from the Atlantic sea-bed in 1869!

tached to the stems of the herbaceous plant around which the specimen of *Spongilla Carteri* had grown (Pl. XVI. fig. 1); variable in size under 1-51st of an inch in diameter (fig. 2); composed of a spiculiferous capsule (figs. 2, *d*, and 3, *c*), a chitinous coat *which is also spiculiferous* (figs. 2, *c*, 3, *b*, and 4), and the usual germinal contents (figs. 2, *a* and 3, *a*), but no distinct cellular coat. Spicules of the statoblasts slightly curved, thick, cylindrical, more or less obtuse at the ends, about 9 by 2-6000ths inch in greatest dimensions (fig. 5, *a*), or comparatively thin, fusiform, and more or less pointed at the ends, about 10 by 1-6000th inch in greatest dimensions (fig. 5, *b*); both thickly spined and varying in stoutness inversely with their proximity to the surface; arranged horizontally, so that the ends do not project beyond the level of the statoblast, where they more or less cross each other and are held together by granules (? the microcell-structure, (fig. 2, *d*); appearing also in the chitinous coat, where they do *not* cross each other, but form a *single* layer, in which the spicules lie more or less parallel to each other in various directions, so as to present a damaskened appearance (fig. 4). Skeleton-spicules of one form only, viz. acerate, curved, fusiform, gradually sharp-pointed, smooth, or microspined, about 22 by 1-1800th inch in its greatest dimensions (fig. 6, *a*, *b*). Aperture of the statoblast sunken, single or in plurality (3–4), lined by a tubular projection of the chitinous coat (fig. 3, *d*).

Hab. Freshwater tank.

Loc. Island of Bombay.

Obs. The most characteristic part of this species of *Spongilla* is, that the chitinous coat is spiculiferous, as above described, and that, when the statoblast is divided through the middle or the outer layer crushed, it also comes out divided or entire as the case may be (fig. 3, *b*), when it may be mounted in Canada balsam, and then presents the damaskened appearance to which I have alluded, which becomes a very beautiful microscopic object, owing to the layer of spicules lying more or less parallel to each other, although in different directions, being immersed in the transparent light amber-coloured chitinous substance of which the coat is otherwise composed (fig. 4). The way in which the statoblast is firmly fixed to the stem of the plant is also peculiar, inasmuch as the thick spiculiferous or external coat is continued onto the wood, thus forming a kind of neck or expanded base, which is so strongly attached as to bring away a portion of the wood when removed; while the "aperture," single or in plurality as above stated, varies in position on the *free* surface. They are for the most part more or less emptied of their germinal

contents, and surrounded by a little sponge-structure, in which the skeleton-spicules above described are found, one of which *being microspined* at once distinguishes them from those of *Spongilla alba* and *S. Carteri*, by whose statoblasts respectively and only they are frequently accompanied. As the specimen of *Spongilla Carteri* was taken from the tank (an old quarry in the Trap) in the month of October, and the living green herbaceous *annual* on which it was found grew near the edge, while the water of the "rainy season" in the tank did not reach this until the end of July, the specimen of *S. Carteri* being globular and *three* inches in diameter, embracing the stem of the plant, it follows that this, together with every thing else that accompanied it, must have been developed there in less than three months.

EXPLANATION OF PLATE XVI.

N.B.—Figures 2, 3, 6, 9, and 10, with all their detail, are relatively magnified on the scale of 1-24th to 1-1800th inch. The rest are more magnified.

Fig. 1. *Spongilla bombayensis*, n. sp., statoblasts *in situ*. Natural size.

Fig. 2. The same. Section of the statoblast through the aperture. *a*, cavity filled with germinal matter; *b*, membrane enclosing the same; *c*, chitinous coat charged with statoblast-spicules; *d*, thick or external spiculiferous coat; *e*, aperture. Diagram.

Fig. 3. The same. Statoblast broken open. *a*, germinal matter issuing; *b*, chitinous coat charged with statoblast-spicules; *c*, portion of thick or external spiculiferous coat; *d*, apertural tube of chitinous coat. Diagram.

Fig. 4. The same. Portion of chitinous coat, more magnified, to show arrangement of the spicules with which it is charged. Diagram.

Fig. 5. The same. Spicules of the statoblast generally, much more magnified. *a*, inner, *b*, outer form.

Fig. 6. The same. Skeletal and statoblast-spicules, relatively magnified. *a*, smooth, *b*, spinous skeletal spicule; *c*, statoblast-spicules.

Fig. 7. *Spongilla alba*. Sketch of "isolated" cell, with cilia waving internally, but no aperture; in appearance and size like the "ampullaceous sac," viz. 1-700th to 1-560th inch in diameter. (Sketched March 1857.)

Fig. 8. The same. Group of monociliated cells, consisting of:—*a*, monociliated sponge-cell (spongozoon); *b*, ? sperm-cell, zoosperm or spermatozoon; *c*, the latter attached to the former. (Sketched August 1854).

Fig. 9. *Spongilla segregata*, Potts. Section of the quadrilocular statoblast near the centre, to show that it is tetrasporal. *a a a a*, statoblastlets; *b b b b*, chitinous coats of the same, respectively; *c c c c*, position of apertures of the same; *d d*, crust or cellular coat; *e e*, spiculiferous or external layer; *f*, single spicule of the latter, to show that it is spiniferous; *g g g*, apertural tubular prolongations of the "cellular coat," opposite the statoblasts respectively. Diagram.

Fig. 10. The same. Young form of the quadrilocular statoblast, before the cellular coat &c. is added. *a a a a*, cavities of the young statoblastlets respectively; *b b b b*, chitinous coats; *c c c c*, apertures repectively.

Fig. 11. The same. *a*, surface of the cellular coat, or crust; *b*, vertical section of the same, to show the hexagonal form of the cells, and their resemblance to plant-structure.

Fig. 12. *Parmula Brownii*. Portion of the crust, or cellular coat, much magnified, to show that it is composed of spherical cells of variable diameter heaped together irregularly.

XXXIX.—*Descriptions of new Species of Lepidoptera from Tenasserim.* By Arthur G. Butler, F.L.S., F.Z.S., &c.

The Lepidoptera described in the present paper form part of a fine series of rare and interesting species collected in the Thoungyeen valley by Capt. Charles Bingham, and generously presented by him to the national collection.

Among the more valuable species in this series the following are worthy of note:—

Several new or interesting members of the subfamily Euplœinæ, amongst which is one supposed to be *E. Adamsonii*, Marshall, and which is my *E. margarita*; *Thaumantis pseudaliris* (the type of which was collected in Malacca); *T. Louisa*; *Penthema Binghami* and *P. darlisa*; males of a *Charaxes* (apparently *C. scylax*); *Papilio zaleucus*, *P. evan*, and *P. telearchus*; also both sexes of *Adolias xiphiones*, the male only of which was previously known to me.

Rhopalocera.

1. *Loesa fervida*, sp. n.

Allied to *L. oroatis* of Hewitson. Above bright orange-ferruginous, with dusky diffused brownish external borders to the wings; primaries with a small blackish blind ocellus on the first median interspace, its zone a little clearer than the ground-colour: body brownish. Under surface olivaceous brown; basal two thirds of wings darker than the outer third, crossed in the middle by a slender blackish angulated line, and limited externally by a slender lilac stripe: primaries with small white-pupilled black ocelli, with narrow yellow iris, dusky margin, and pale zone on the upper radial and first median interspaces: secondaries with eight ocelli, all small, the fourth and eighth mere points, the fifth largest;